17. Solve graphically the following LPP
Maximize $Z = 2x_1 + 3x_2$
Subject to the constraints
$x_1 - x_2 \geq 2$
$x_1 + x_2 \geq 4$
and $x_1, x_2 \geq 4$

18. Use penalty method to solve the LPP.
Maximize $z = 3x_1 + 2x_2$
Subject to
$2x_1 + x_2 \leq 2$
$3x_1 + 4x_2 \geq 12$
and $x_1, x_2 \geq 0$

19. Solve the transportation problem

	1	2	3	4	Supply
I	21	16	25	13	11
II	17	18	14	23	13
III	32	27	18	41	19
Demand	6	10	12	15	

20. Solve the assignment problem.

	I	II	III	IV
A	18	24	28	32
B	8	13	17	19
C	10	15	19	22

APRIL/MAY 2025

FASC32/CASC32/BASC32 — QUANTITATIVE TECHNIQUES – I (ALLIED)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Write any two application of Operation Research.
2. Define nature of Operation Research.
3. Define Linear Programming Problem.
4. Define Slack variable.
5. Define Pseudo-optimal solution.
6. Define Surplus variable.
7. Define feasible solutions.
8. Write mathematical formulation of Transportation Problem.
9. Define Cost matrix.
10. Define optimal assignment problem.

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SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions.

11. (a) What is the significance of Operation Research?

Or

(b) Write about the scope of operation research.

12. (a) Write procedure for Linear Programming Problem.

Or

(b) Solve graphically the following LPP

Maximize $Z = 3x_1 + 2x_2$

Subject to the constraints

$-2x_1 + x_2 \leq 1$

$x_1 \leq 2$

$x_1 + x_2 \leq 3$

and $x_1, x_2 \geq 0$

13. (a) Describe Two-Phase method algorithm for solving LPP.

Or

(b) Write the procedure for least cost method.

14. (a) Explain test of optimal solution.

Or

(b) Solve transportation problem.

				Supply
	1	2	6	7
	0	4	2	12
	3	1	5	11
Demand	10	10	10	

15. (a) Explain Hungarian Assignment method.

Or

(b) Solve the following assignment problem.

worker / *job*	*A*	*B*	*C*	*D*
1	10	20	18	14
2	15	25	9	25
3	30	19	17	12
4	19	24	20	10

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain application of Operation Research.

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